

PIONEER

NATURAL RESOURCES ALASKA

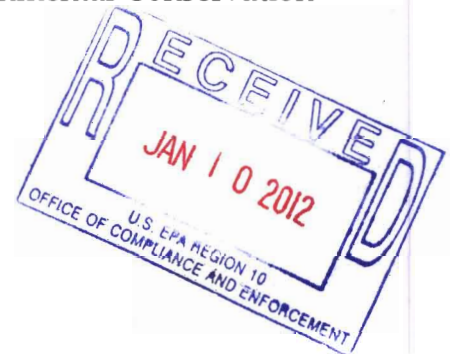
Pioneer Natural Resources Alaska, Inc
700 G Street, Suite 600
Anchorage, Alaska 99501
Tel: (907) 277-2700 Fax: (907) 343-2193

January 3, 2012

Director, Office of Water
U.S. Environmental Protection Agency
Region 10
1200 Sixth Avenue, OW-133
Seattle, Washington 98101

State of Alaska
Department of Environmental Conservation
Water Division
555 Cordova Street
Anchorage, AK 99501

RE: Cosmopolitan Development Project
Notice of Intent, NPDES General Permit AKG-31-5004



Dear Sir or Madam,

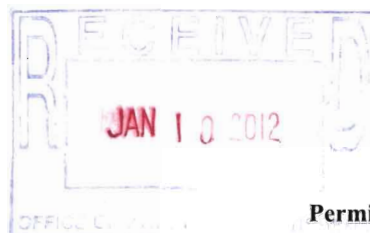
Pioneer Natural Resources Alaska, Inc. (Pioneer) is submitting the attached Notice of Intent for a discharge associated with waterflooding (discharge number 014) at the proposed Cosmopolitan Development Project north of Anchor Point, Alaska. This discharge is currently authorized under AKG-31-5004. Although construction of the facility has not yet commenced, we are submitting this NOI to continue coverage of the discharge and allow future construction.

Please contact me at (907) 343-2112 or John Hellén at (907) 343-2102, if you have any questions.

Sincerely,

Todd Abbott
President, Pioneer Natural Resources Alaska, Inc.

Attachments: AKG-31-5000 Notice of Intent
Cosmopolitan Development Project Plan of Operations



NOTICE OF INTENT (NOI) INFORMATION SHEET
NPDES GENERAL PERMIT AKG-31-5000
OIL AND GAS EXPLORATION FACILITIES
ON THE OUTER CONTINENTAL SHELF AND CONTIGUOUS STATE WATERS

Discharges (check all that apply)					
<input type="checkbox"/>	001 Drilling Mud and Cuttings	Water Depth:			
<input type="checkbox"/>	002 Deck Drainage	Water Depth:			
<input type="checkbox"/>	003 Sanitary Waste	Water Depth:			
<input type="checkbox"/>	004 Domestic Waste	Water Depth:			
<input type="checkbox"/>	005 Desalination Unit Waste	Water Depth:			
<input type="checkbox"/>	006 Blowout Preventer Fluid	Water Depth:			
<input type="checkbox"/>	007 Boiler Blowdown	Water Depth:			
<input type="checkbox"/>	008 Fire Control System Test Water	Water Depth:			
<input type="checkbox"/>	009 Non-Contact Cooling Water	Water Depth:			
<input type="checkbox"/>	010 Uncontaminated Ballast Water	Water Depth:			
<input type="checkbox"/>	011 Bilge Water	Water Depth:			
<input type="checkbox"/>	012 Excess Cement Slurry	Water Depth:			
<input type="checkbox"/>	013 Mud, Cuttings, Cement at Seafloor	Water Depth:			
<input checked="" type="checkbox"/>	014 Waterflooding Discharges	Water Depth:	28 feet		
<input type="checkbox"/>	015 Produced Water and Produced Sand	Water Depth:			
<input type="checkbox"/>	016 Completion Fluids	Water Depth:			
<input type="checkbox"/>	017 Workover Fluids	Water Depth:			
<input type="checkbox"/>	018 Well Treatment Fluids	Water Depth:			
<input type="checkbox"/>	019 Test Fluids	Water Depth:			
Type of Sanitary Discharge: <input type="checkbox"/> M10 <input type="checkbox"/> M91M <input type="checkbox"/> Other (specify):					
Provide a brief description of the treatment process(es) and disposal practices (e.g., backhauled, reinjected, discharged, etc.) at the facility.					
Provide a line drawing that shows flows of discharged waste streams through the facility. Indicate intake sources, operations contributing to the effluent, and treatment units labeled to correspond to the discharges (001 - 019). Construct a flow balance on the line drawing by showing average flows between intakes, operations, treatment units, and outfalls. If a flow balance cannot be determined, provide a pictorial description of the nature and amount of any sources, and any collection or treatment measures.					
Drilling Fluid					
Category <i>(check all that apply)</i>	<input type="checkbox"/>	Water-based	Group <i>(check all that apply)</i>	<input type="checkbox"/>	Lignosulfonate
	<input type="checkbox"/>	Oil-based		<input type="checkbox"/>	Lime
	<input type="checkbox"/>	Synthetic-based		<input type="checkbox"/>	Gyp
	<input type="checkbox"/>	Other (specify):		<input type="checkbox"/>	Sea-water
Estimated Total Discharge Volume: 17,500 gallons twice per year			<input type="checkbox"/>	Saltwater	
			<input type="checkbox"/>	Saturated Saltwater	
			<input type="checkbox"/>	Nondispersed (Viscosifier/Polymer)	

APPENDIX E

NOTICE OF INTENT (NOI) INFORMATION SHEET
NPDES GENERAL PERMIT AKG-31-5000
OIL AND GAS EXPLORATION FACILITIES
ON THE OUTER CONTINENTAL SHELF AND CONTIGUOUS STATE WATERS

APPLICANT (Owner/Operator)					
Owner Name:	Pioneer Natural Resources		Operator Mailing Address:	700 G Street, Ste 600	
Telephone Number:	907-343-2102			Anchorage, AK 99501	
Operator Name:	(Same as above)				
Telephone Number:					
FACILITY					
Facility Name:	Cosmopolitan Development		Facility Mailing Address:	700 G Street, Ste 600	
Contact Name:	John Hellén			Anchorage, AK 99501	
Telephone Number:	907-343-2102				
Beginning Date of Operation:			Stationary Facilities	Latitude:	59.8583°
Expected Duration of Operation:				Longitude:	-151.8014°
Facility Type (check applicable type)	<input type="checkbox"/>	Jackup	Mobile Facilities	Initial Latitude:	
	<input type="checkbox"/>	Drill Ship		Initial Longitude:	
	<input type="checkbox"/>	Semisubmersible			
	<input checked="" type="checkbox"/>	Other (specify): Onshore			
<p>Submit a site map showing the exact location of facility and discharges associated with the project. Mobile facilities may designate an area where they may be operating and must include a map showing those areas and a description of operations within those areas. If the operation is within 4000 meters of a prohibited area of discharge indicated by the permit, those areas and their distance from the operation must be shown on the map.</p>					
RECEIVING WATER – Cook Inlet					
<input checked="" type="checkbox"/>	Coastal Waters		<input type="checkbox"/>	Territorial Seas	
<input type="checkbox"/>	Offshore Waters				
Initial date and expected duration of operations:					
LOCATION OF DISCHARGE					
MMS	Lease Number		ADNR	Lease Number	ADL18790
	Block Number			Block Number	
Range of water depths below mean lower low water (MLLW) in the lease block:		From:	0'	To:	40-50'

NOTICE OF INTENT (NOI) INFORMATION SHEET
NPDES GENERAL PERMIT AKG-31-5000
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ON THE OUTER CONTINENTAL SHELF AND CONTIGUOUS STATE WATERS

100-Meter Mixing Zone Request*(applicable to sanitary discharges within State of Alaska/Coastal Waters)*

Are you requesting a mixing zone from ADEC?	<input type="checkbox"/>	Yes (continue filling out this section)	<input checked="" type="checkbox"/>	No (skip this section and proceed to Special Conditions, below)
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THE FOLLOWING INFORMATION MUST BE PROVIDED IF REQUESTING A MIXING ZONE. The burden of proof for justifying a mixing zone through demonstrating compliance with the requirements of 18 AAC 70.240 through 18 AAC 70.270 rests with the applicant.

Distance from shoreline of discharge point or first port of diffuser (measured at M.L.L.W.):		Length of diffuser:	
Depth of discharge port or diffuser (measured at M.L.L.W.):		Diameter of port(s):	
Orientation of diffuser to shoreline (e.g., perpendicular, 45°, parallel):		Number of ports:	
Maximum current:		Port spacing:	

USES OF RECEIVING WATER AT DISTANCE FROM DIFFUSER i.e. Supply for drinking water, Supply for agriculture including irrigation & stock water, Supply for aquaculture, Supply for industrial use, Contact recreation, Secondary recreation, Fish spawning, Harvesting and consumption of raw fish, or other aquatic life (Not needed if not requesting a mixing zone from ADEC):

If possible, provide salinity and temperature data from the receiving water surface to the depth of the discharge port or diffuser.

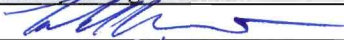
Special Conditions *(provide justification for all that are not required, completed or provided)*

Special Monitoring	<input type="checkbox"/>	Required	<input checked="" type="checkbox"/>	Not Required	Justification: N/A for 014
Exploration Plans	<input checked="" type="checkbox"/>	Attached	<input type="checkbox"/>	Not Provided	Justification:
Biological Survey(s)	<input checked="" type="checkbox"/>	Attached	<input type="checkbox"/>	Not Provided	Justification:
Environmental Report(s)	<input checked="" type="checkbox"/>	Attached	<input type="checkbox"/>	Not Provided	Justification:
Drilling Fluid Plan	<input type="checkbox"/>	Complete	<input type="checkbox"/>	Not Complete	Justification: N/A for 014
Environmental Monitoring Study Plan (II.B.5.)	<input type="checkbox"/>	Attached	Date of Submittal: _____ N/A for 014		

NOTICE OF INTENT (NOI) INFORMATION SHEET
NPDES GENERAL PERMIT AKG-31-5000
OIL AND GAS EXPLORATION FACILITIES
ON THE OUTER CONTINENTAL SHELF AND CONTIGUOUS STATE WATERS

Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature:		Date:	1/3/12
Printed Name:	Todd Abbott	Title:	President

Mail Completed NOI to EPA and ADEC at the following addresses:

US EPA
1200 6th Avenue, M/S OWW-130
Seattle, WA 98101

ADEC, Water Division
555 Cordova Street
Anchorage, Alaska 99501



Pioneer Natural Resources Alaska, Inc.

700 G Street, Suite 600
Anchorage, Alaska 99501

Cosmopolitan Development Project

Plan of Operations Anchor Point, Alaska

Facility Construction, Drilling, and Production Operations

November 2009

Submitted to:

State of Alaska
Department of Natural Resources
Division of Oil and Gas

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Appendix

A 2009 Lease Mitigation Measure Analysis

1.0 Introduction and Project Summary

1.1 General Project Description

Pioneer Natural Resources Alaska, Inc. (Pioneer) is proposing to construct an onshore drillsite, production facilities, and offshore water intake on the Kenai Peninsula (Figure 1-1, Project Location Map). Production would occur from offshore state leases ADL 018790, 384403, 384404, 387102, 389230, 389525, and 389526, and federal leases OCS-Y-1664 and Y-1665 (Figure 1-2, Lease Map). The production drillsite would be located on private leased property located approximately 5.5 miles north of Anchor Point (Figure 1-3).

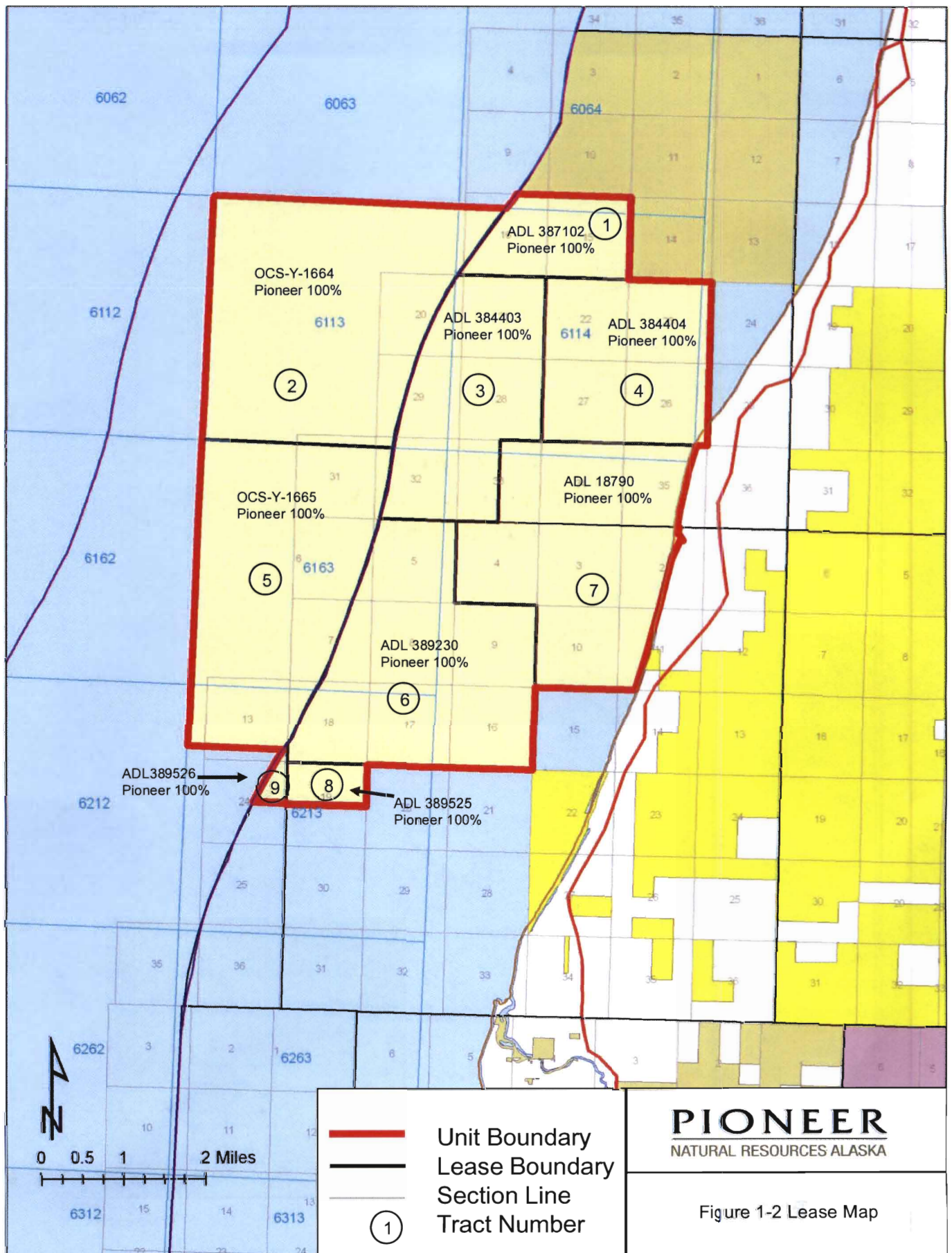
The existing exploration pad would be used for drilling activities and expanded by approximately 15 acres to accommodate production facilities. Most of the pad expansion would be into an existing gravel pit and no fill of wetlands will be necessary. The proposed plan includes 11 to 28 wells. About half the wells would be producer wells, the other half waterflood injector wells. The proposed facilities are entirely on private property located between the Sterling Highway and the Cook Inlet. Access is available on existing roads.

A seawater intake is proposed to provide water for reservoir pressure management. An intake pipe would be installed from the drillsite to a location ~2,300 feet offshore using horizontal directional drilling (HDD). No surface or marine wastewater discharges are planned.

Sales quality oil would be transported from the production site to the refinery in Nikiski via tanker trucks. Produced gas will be either reinjected into the formation or a pipeline will be extended to the production site by a third party. Therefore a detailed description of a gas pipeline is not included in this Plan of Operations.

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1.2 Economic Benefits

The proposed Cosmopolitan Development Project would economically benefit both private and public parties. The Kenai Peninsula Borough (KPB) regional government would likely receive 1 to 2 million dollars annually in property taxes from this project. Taxes from the project would contribute important revenues for major KPB services such as schools, health care facilities, and social services. The KPB would also benefit from increased employment opportunities for its residents.

The State of Alaska is an owner of surface and subsurface mineral rights within the proposed development area. The State would receive royalties from this development.

The federal government is an owner of offshore subsurface mineral rights within the proposed development area. The federal government would receive royalties. The federal government would benefit from new oil and gas production that would contribute to the nation's domestic energy supplies and production rates. The federal government would also profit from corporate and personal taxes generated as a result of the Cosmopolitan Development Project.

Other economic benefits would result from contract awards to Alaska-based contractors for project jobs, materials, and services. Enhanced employment opportunities for the Alaskan workforce would also result from the Cosmopolitan Development Project. Oil from the project will help offset the declining production from Cook Inlet and support the long term viability of the refinery in Nikiski.

2.0 Lease Description

Cosmopolitan development would produce hydrocarbon resources from offshore state leases ADL 018790, 384403, 384404, 387102, 389230, 389525, and 389526 and federal leases OCS-Y-1664 and Y-1665 (Figure 1.2, Lease Map).

2.1 Lease Mitigation Measures

2009 Cook Inlet Areawide Mitigation Measures apply to this project.

2.2 Offshore Lease Activities

The targeted oil production zone for this development is found within the Hemlock and basal Tyonek reservoirs. The depositional environment for these reservoirs is interpreted to be fluvial with provenance from the volcanic arc to the west and the accretionary complex to the east. The reservoir is lower quality than most other producing oil fields of the Upper Cook Inlet. The field is located over a thrust anticline.

Although the target reservoirs are located offshore, Pioneer intends to place development facilities onshore. The only offshore equipment other than the subsurface development wells will be a seawater intake system, which Pioneer plans to use as a water source for injection to enhance oil recovery. Pioneer evaluated using groundwater for this purpose, but given the relative scarcity of groundwater in the area, is proposing the use of seawater and produced

water. Early in field life it will be mostly seawater, with produced water gradually replacing seawater as the field ages. Seawater will be pumped to the production site from an offshore intake, commingled with produced water, and treated to make suitable for reservoir injection.

Seawater Intake

Various seawater intake designs were considered, including a surface-laid pipe, a trench-buried pipe, a beach infiltration gallery, and an horizontal directionally drilled (HDD) pipe. To minimize surface impacts, Pioneer is proposing to install the intake piping using horizontal directional drilling. Using this technique, a borehole will be drilled from the production site, under the bluff and shoreline, exiting from the seafloor approximately 2,300 feet offshore (Figures 2-1 and 2-2). A tracking wire may be temporarily placed on the surface alignment (on and offshore) to guide directional drilling.

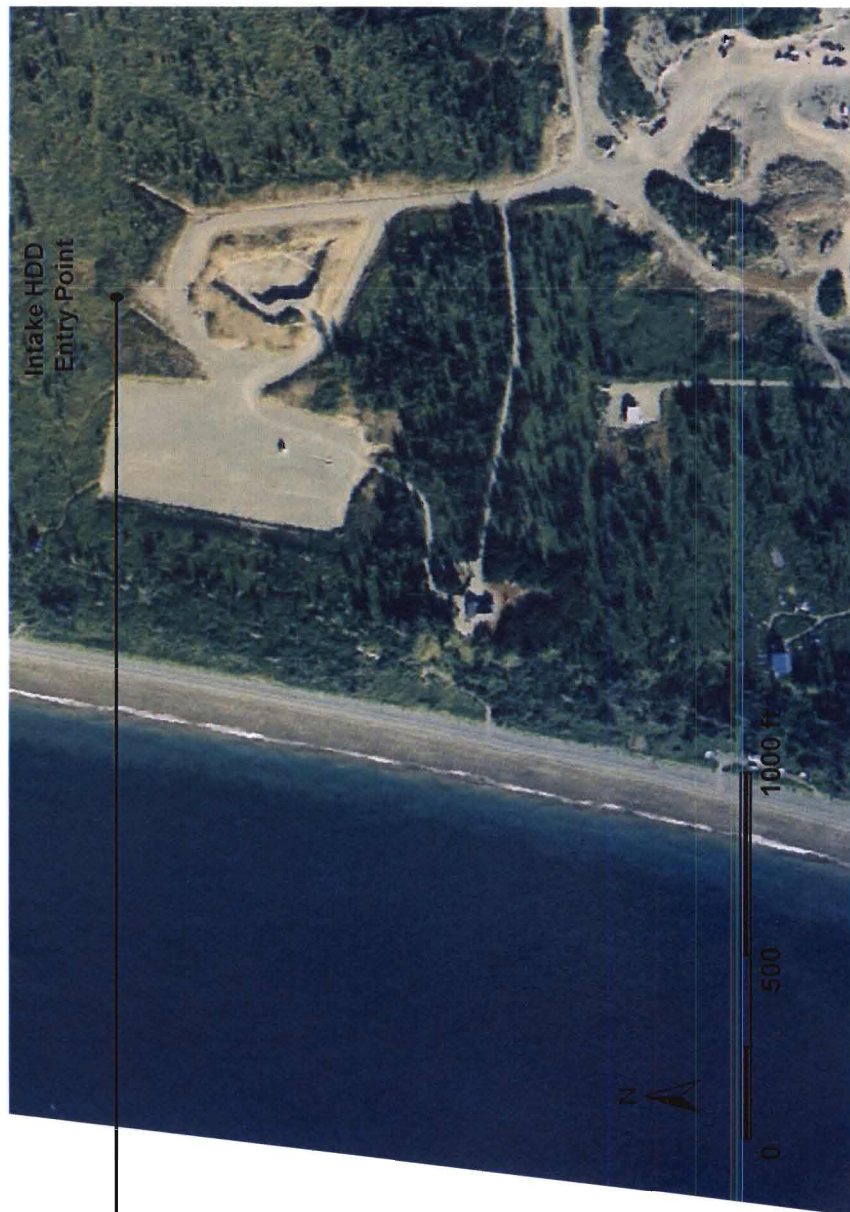
Drilling fluid, consisting of a mixture of fresh water, bentonite, and benign polymers, will be used to maintain hole integrity, transport cuttings to the surface, and drive and lubricate the drill bit. When the borehole intersects the seafloor, some of the drilling fluids in the well bore will exit into the water. However, to minimize discharge of solids the drilling fluids will be displaced with water after pilot hole drilling and push-reaming operations prior to the borehole exiting the seafloor. A frac-out plan will be developed to prevent and mitigate any premature release of drilling fluids. Waste drilling fluids and cuttings will be used on site or transferred off-site for disposal as described in Section 13.

After completion of the 16-inch borehole, a 12-inch, high-density polyethylene intake pipe will be inserted from the surface location to the seafloor exit. The pipe will be installed by a combination of pushing from the surface and pulling a cable attached to the pipe from a barge anchored near the exit point. The final step will be to pig the pipe from the surface to the intake, discharging fresh and salt water and a small amount of residual drilling fluids in the process.

After installation of the intake pipe it will be connected to an intake structure located on the seafloor at a water depth of approximately 28 feet mean lower low water (MLLW) (Figure 2-1). The structure consists of the intake device connected to a settling tank with manways to allow later cleanout of accumulated sediment.

For protection from currents and erosion, Pioneer proposes to install most of the structure below the seafloor grade (Figure 2-3). This will require a shallow 5 foot deep seafloor excavation. Approximately 150 cubic yards of material will be sidecast from an excavation of approximately 2500 square feet (0.06 acres). The excavated material will be replaced with ballast rock and the subsurface portion of the structure will be overlain by a concrete block articulated mat.

The intake structure will be equipped with a screen to prevent entrainment and entrapment of fish (Figures 2-3 and 2-4). The intake velocity is designed to be less than 0.5 feet per second and the screen openings will be 1.75 millimeters. The screen will be constructed of copper-nickel alloy to prevent biofouling. A shroud will be placed around the screen for protection and to mitigate any conflicts with marine activities. Cleanout manways will also penetrate the ballast mat, but the rest of the structure will be below grade.



Intake HDD
Entry Point

Intake HDD
Exit Point

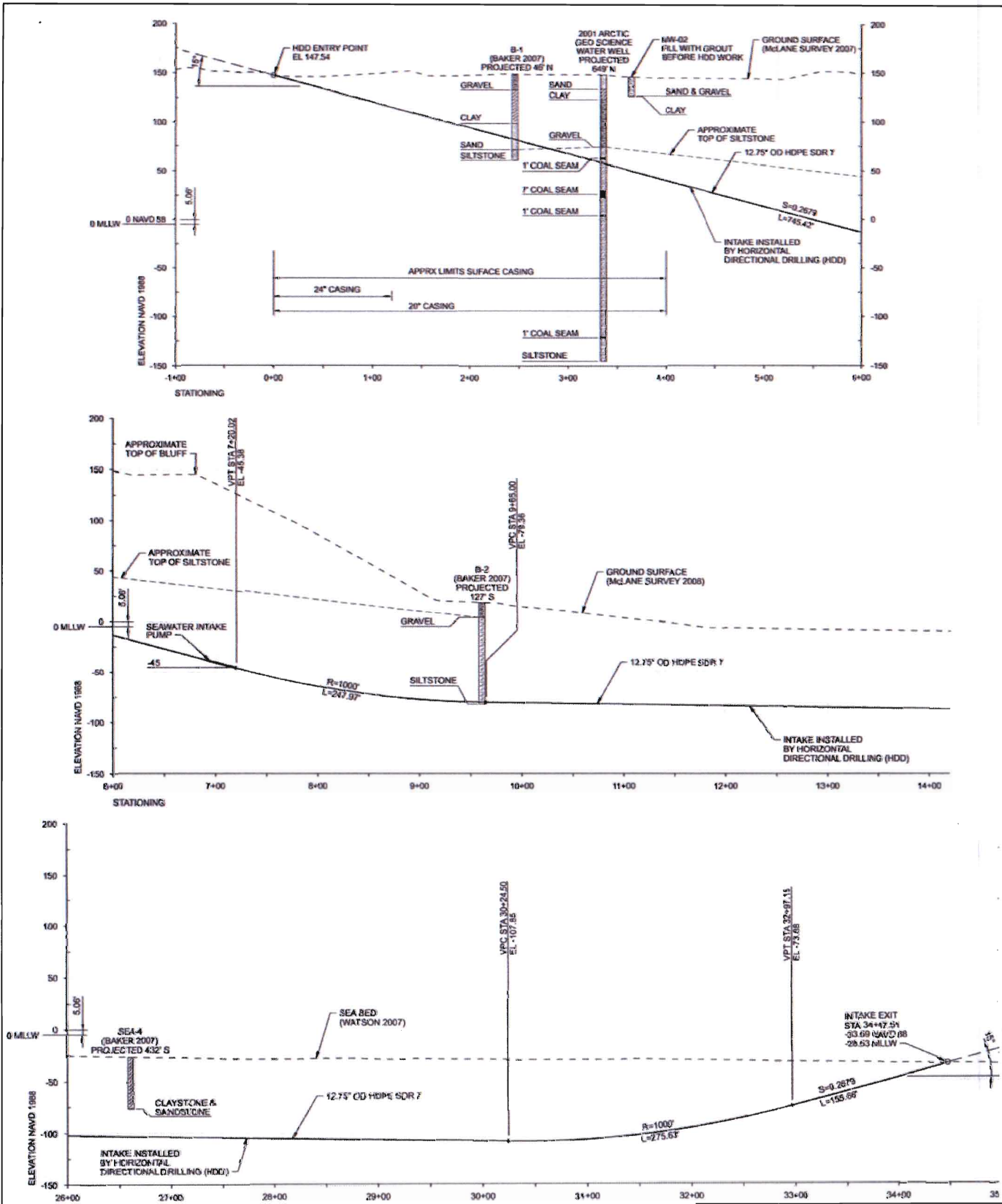
Pioneer Natural Resources Alaska, Inc.

Cosmopolitan Seawater
Intake Plan View

Figure 2-1

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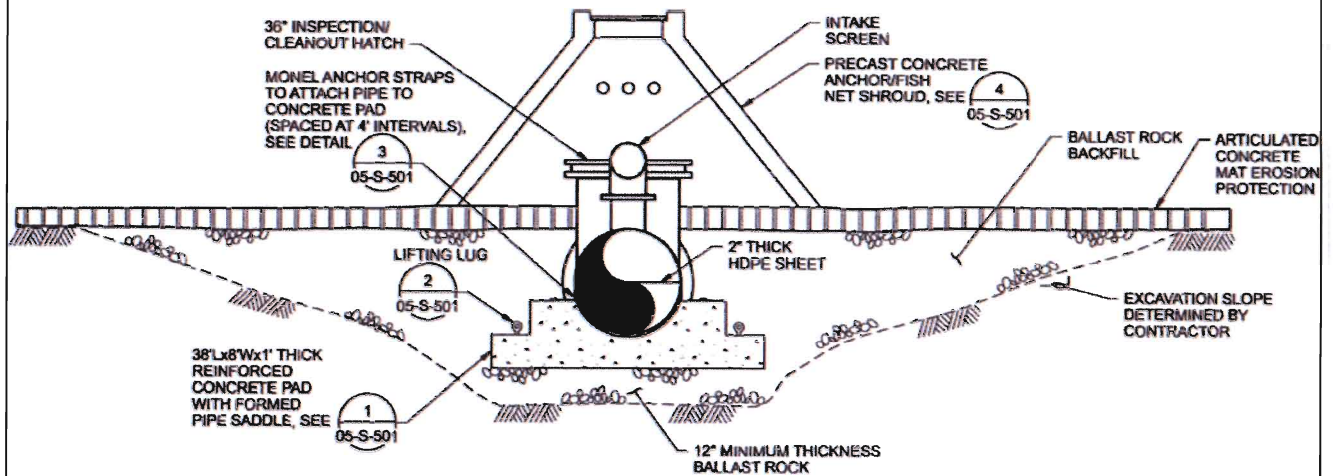
Pioneer Natural Resources Alaska, Inc.

Cosmopolitan Seawater Intake Profile

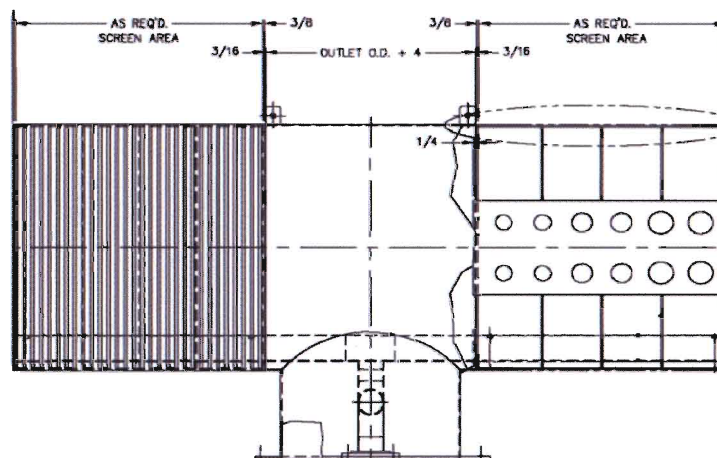
Figure 2-2

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A SECTION
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Intake Screen

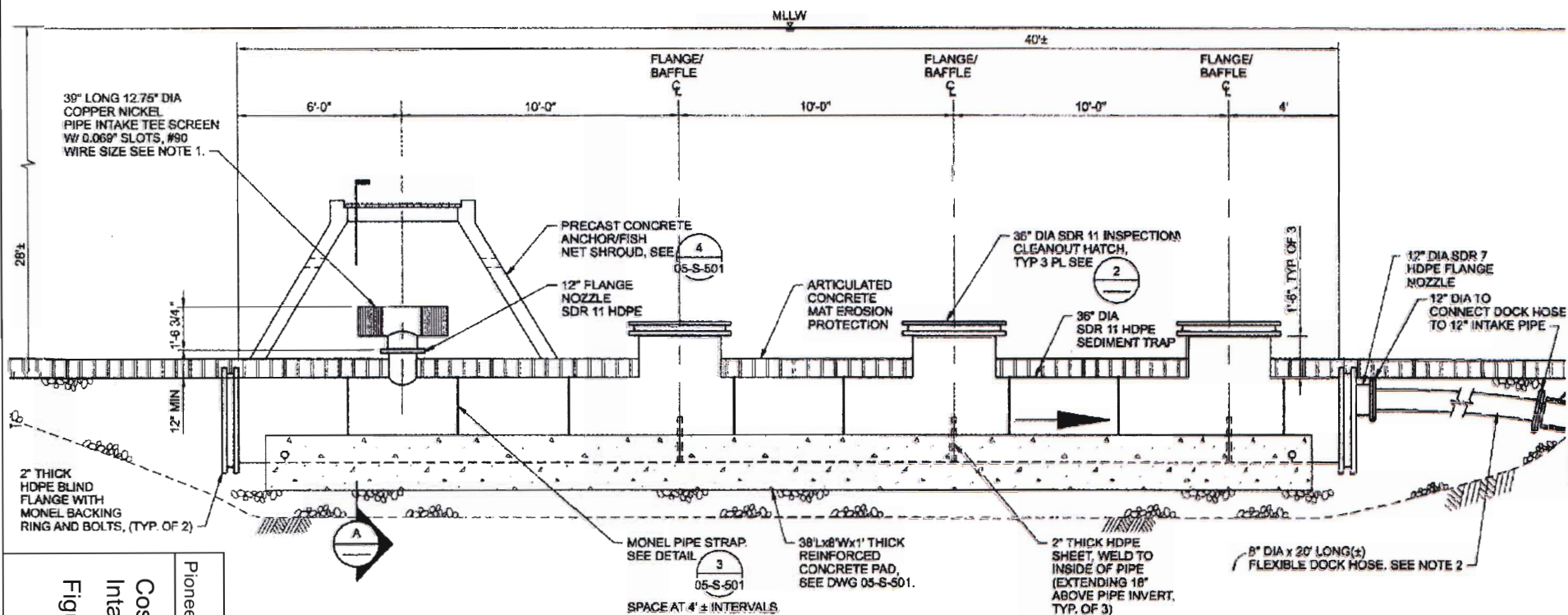
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Cosmopolitan Seawater
Intake Structure End View

Figure 2-3

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Pioneer Natural Resources Alaska, Inc.

Cosmopolitan Seawater
Intake Structure Side View

Figure 2-4

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Periodic pigging of the seawater intake line will be used to remove accumulated sediment or biological growth. The pigs will be inserted from the surface and driven down the pipe using untreated seawater previously collected in temporary tanks. Seawater in the pipe will be discharged from the intake until the pig is received at the intake structure. A diver will be used to retrieve the pig and periodically clean out the intake structure.

An outfall line for discharge of seawater treatment solids was considered, but rejected in favor of a zero-discharge treatment process.

3.0 Drillsite Facilities

All drilling and production facilities will be located on an onshore parcel of land leased from a private party. The existing 5-acre exploration drillsite will be used for development wells. The gravel pad will be expanded by 15 acres to accommodate the production facilities (Figure 3-1). The proposed site has previously been developed as a gravel pit. Pioneer evaluated several options for the production and drillsite. Although production will come from reservoirs two to three miles offshore, development from an onshore location using extended reach drilling was preferred to an offshore platform. Compared to other possible onshore locations, the proposed location is closer to the target reservoirs, has only limited nearby residential development, is adjacent to existing industrial uses (gravel pits), and is farther from public use areas. Use of this site will require an exception to the ½-mile waterbody setback (Lease Mitigation Measure 1(c)), but given the alternatives is the preferred location. The production facility design will incorporate features to minimize potential impacts to Stariski Creek, such as lined containment for hazardous substance storage areas, site grading, and berming.

The Cosmopolitan drillsite will require an approximate five-acre footprint to support the drillsite infrastructure and three- to five-year drilling program. The existing drillsite may be expanded slightly to the south. This design will accommodate 11 producer/injector wells and 17 spare slots for future wells. Requisite production facilities are described below and will be placed on the 15 acre pad expansion for a total development footprint of ~20 acres. Overburden from clearing the site will be placed on approximately three acres along the eastern edge of the production pad. This berm will be vegetated and provide several functions: visual and sound screening for adjacent properties, storage of material for future site reclamation purposes, and control of stormwater.

Additional gravel and/or well slots may be added later for future expansion opportunities. Gravel will be sourced from the adjacent commercial gravel pit or another commercial source. A land use agreement has been secured with the land owner to support exploration and production programs. This lease agreement provides surface use rights of up to 38 acres around the existing well site.

Drillsite layout will be designed on a trunk and lateral system with an assumed well spacing of 20 feet, subject to change pending drilling rig moving system installation. The plot plan will accommodate a single 28-well row at 20-foot spacing. Final drillsite layout and orientation may be adjusted during detailed engineering.

All drillsite production modules will be prefabricated truckable modules set on piles or load blocks. These modules will be shop fabricated offsite, with dimensions nominally limited to 14 ft. wide x 14 ft. tall x 40 ft. long.

3.1 Drillsite Design

Facilities at the drillsite would include development drilling rig and support packages (drilling fluids, cuttings handling equipment, mud pumps, generators, cement unit, etc.), well cellars and/or well houses, and truckable drilling modules. The preliminary drillsite layout is shown in Figure 3-1.

ESP Support Modules

Artificial lift will be provided by down-hole variable speed electric submersible pumps (ESP). There may be a means of backup artificial lift method provided such as gas lift or jet pumps. At least two modules will be required to support the ESP function. Utility power will be supplied from the production facility; however an assumed transformer module along with a variable frequency drive module(s) will be required onsite.

Well Testing Module

Well testing will be provided by a single-well test separator or multi-phase flow meter, housed in a dedicated well testing module or skid. Heat, electricity and/or chemicals may be required to break the known tight emulsion for accurate well testing. Tested well fluids will recombine with the gross drillsite production for processing at the adjacent production facility.

Chemical Injection

Chemical injection will be required at various drillsite locations, including the wellhead, test separator, and multiphase piping to the production facility. Chemical storage, metering and injection equipment will be provided or shared with the production facility. Likely chemical applications include corrosion and scale inhibitor, emulsion breaker and possibly hydrate, paraffin and asphaltene inhibitors. Additional chemical injection will be required in the production facility.

Power Distribution/Control System Module

Several power supply options were considered including onsite generation using diesel and/or natural gas and extension of utility power to the site. The preferred option to minimize onsite emissions is to extend Homer Electric Association (HEA) grid power to the production facility. However, due to the lead time necessary for HEA, power for the drillsite will initially be a combination of grid power and on-site generation. After completion of HEA upgrades, the rig engines will remain to provide primary or backup power until the completion of drilling. Communication cable will be linked to the production facility. A shared module is required to house the power distribution, motor control center (MCC), and Programmable Logic Control (PLC) functions.

Freeze Protection

Drillsite wellhead and flow line freeze protection will be accomplished by local injection points at strategic locations. A portable trailer mounted freeze protection skid will be employed as needed, rather than installing permanent methanol distribution piping.

Well Heads

Each wellhead will be contained in a sufficiently impermeable cellar, probably without a well house.

Drillsite Piping

The wells will be hooked up using a trunk and lateral piping system. The primary trunk lines include a production header, power fluid header, water injection header, and test header. All four will be heat traced and insulated. Chemical injection tubing headers will also be run from the chemical injection system to each of the wellheads, as required. Power and communication lines will also be located on the header system on cable trays. Some well lateral piping may be buried to make room for the development well drilling rig and well intervention equipment, such as coiled tubing or wireline units. A future produced water injection header may be installed to mitigate scaling and corrosion concerns of mixing seawater and produced water.

Utilities

Several utility systems are required for use at the drillsite, possibly including hydraulic oil, utility water, nitrogen and instrument/utility air.

Offices and Drilling Camp

During the course of development drilling, temporary office and living space for 8-12 personnel may be provided at or adjacent to the site. Additional housing may be provided off-site.

Waste Disposal Facilities

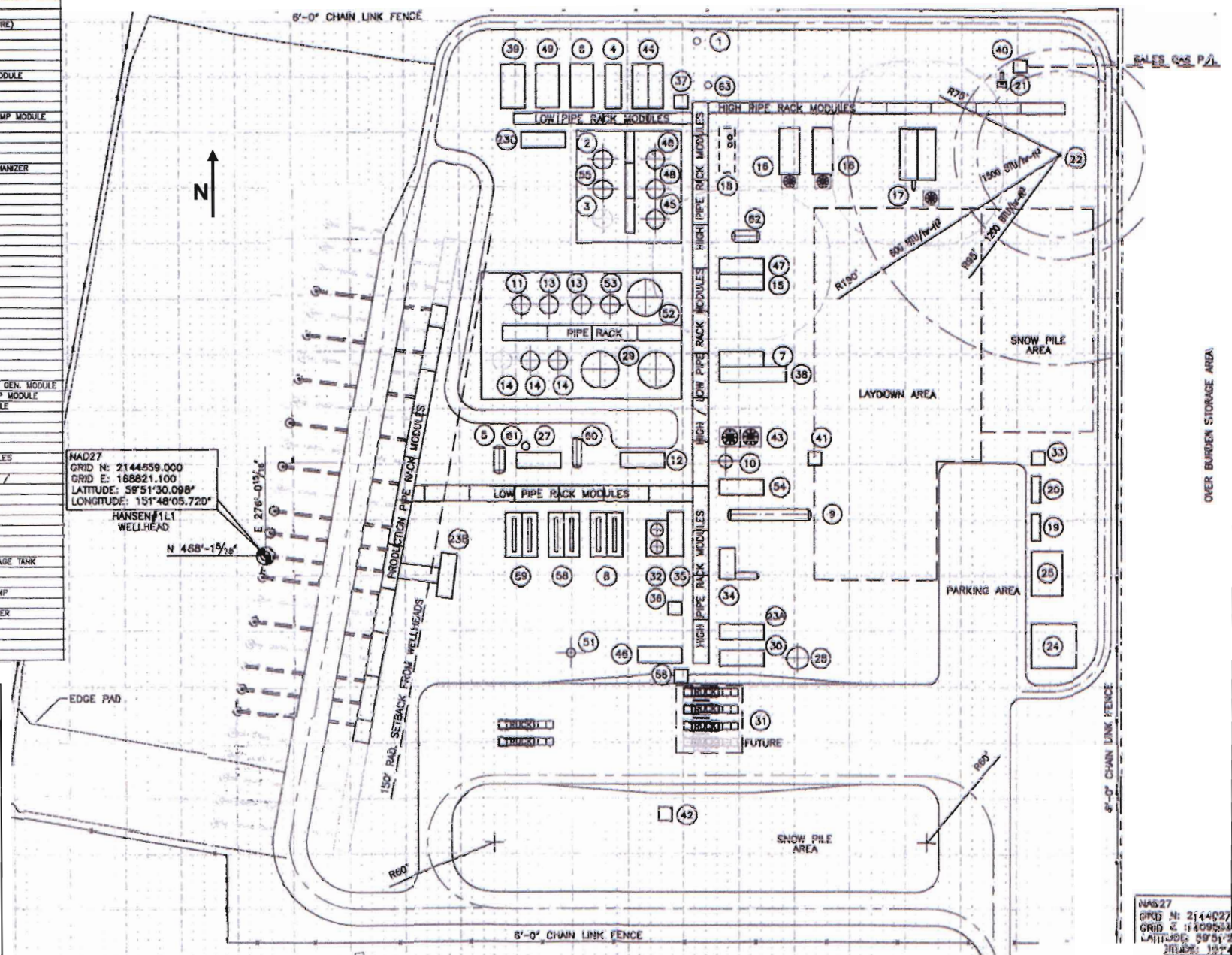
Domestic wastewater generated by the drilling office and quarters will be hauled offsite for disposal or treated with a conventional onsite system. Drilling waste grind and annular injection facilities will be located at the drillsite during drilling activities.

Well Testing Facilities

Temporary equipment for well testing may be periodically brought on site. This could include portable tanks in secondary containment, pumps, and a flare.

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Pioneer Natural Resources Alaska, Inc.
Cosmopolitan Facility Layout
Figure 3-1
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3.2 Production Facilities Design

The Cosmopolitan oil production facility will require an approximate 15-acre footprint to support the nominal 8 MBOPD processing equipment and associated infrastructure.

Production and Injection Pipe Racks

Four process flowlines will be installed between the drillsite and production facility, one for multiphase production, one for individual well testing, one for power fluid and one for waterflood injection. A fifth produced water injection pipe may be installed in the future. These are a continuation of the drillsite trunk and lateral piping discussed in the Drillsite Piping subsection, above. The lines will be heat traced and insulated. Power and communication lines and chemical injection tubing will accompany the pipe routing. These pipe racks will be delivered ready to mount on either piles or load blocks prior to field hook-up.

Production Modules

All production facility modules will be prefabricated, truckable modules set on piles or load blocks. The production modules will incorporate all oil, water and gas processing infrastructure required to support the Cosmopolitan development. These modules will be shop fabricated offsite, with dimensions nominally limited to 14 ft. wide x 14 ft. tall x 40 ft. long. Placement and construction methods will incorporate consideration of hazardous classification, seismic loading, property setbacks and ultimate use. A brief discussion on the types of modules anticipated follows.

Oil Processing

This system of oil processing vessels and tanks will receive three-phase drillsite production and separate the oil, water, and gas streams. Total oil storage volume will be approximately 30,000 barrels. Preliminary design includes an inlet two-phase group separator, two emulsion pre-heaters, one free water knock out drum, two emulsion oil heat exchangers, two heat medium oil exchangers, one heater-treater and one product cooler. Electrostatic grids may also be employed in the heater-treaters. Cyclonic internals and/or chemicals will also likely be used to increase the efficiency and reduce the foot print of these tanks and vessels.

Gas Processing/Compression

The only gas stream within the production facility should be residual solution gas from the multiphase oil stream. Solution gas will be captured from each of the oil processing vessels and tanks, as well as from the oil surge, water skim and slop oil tanks. Carbon dioxide and hydrogen sulfide levels should be acceptable without further treating. Water and hydrocarbon dewpoint conditioning will be accomplished by a propane refrigeration skid. Residual NGL's will be stabilized and handled by a combination of the following methods: 1) combusted as fuel for onsite equipment, 2) blended into the sales oil stream and, 3) shipped via pressurized tankers to industrial consumers. Conditioned gas will be used for onsite fuel gas, potentially injected for reservoir management, with the residual being compressed and

shipped through the gas sales pipeline to Southcentral Alaska markets by a third party pipeline.

Water Processing/Injection

Water from each of the oil separation vessels and tanks will be directed into the water skim tank where retention time and centrifugal motion will strip residual oil prior to high pressure waterflood injection. The 10 MBWPD waterflood injection requirement will require substantial makeup early in field life, due to the limited produced water availability. Injection makeup water will be from Cook Inlet seawater through a subsea intake system. Filtration, de-oxygenation, oxygen scavenger and biocide injection will be used to treat the seawater and produced water prior to injection. Produced water and seawater will be treated with a zero-discharge process for injection. Solids separated from the water stream will be disposed of at the local landfill or another authorized off-site location.

Chemical Injection

Production facility chemical injection may include scale and corrosion inhibitor in the production piping, emulsion breaker in the oil processing system; biocide, oxygen scavenger and scale inhibitor in the water treating and injection system; and hydrate, paraffin or asphaltene inhibitors in the oil sales systems. This will include tanks, metering pumps and distribution tubing, as required. A complementary chemical injection system will provide similar functionality for drillsite, as discussed earlier.

Control Systems

A redundant programmable logic controller (PLC) will be incorporated into the facility design for both normal process control and emergency shutdown safety functions. Additionally, a dedicated Fire and Gas PLC based control system will be installed. These systems will provide for continuous monitoring capabilities of operations at both the drillsite and production facility. The primary control room will be staffed 24 hours per day and located at the production facility, with a remote operator station located within the production facility.

Power Generation and Distribution

Power for use at the drillsite, production facility, and possibly the drilling rig will be purchased from Homer Electric Association (HEA) power grid. Back-up diesel fired power generation will be available for safe facility shut-down and critical loads, rather than full facility operation.

Electrical Switchgear, Distribution Equipment, Transformers

Power purchased from Homer Electric Association (HEA) power grid will be directed, transformed and distributed from designated areas within the production facility for all drillsite, production facility, and drilling load centers.

Utilities

Several utility systems are required for use at the production facility, including fuel gas, instrument/utility air, utility heat medium, utility water, and production waste collection and treatment equipment.

Back-up Power Generator

Back-up power generation and distribution equipment will be located within the production facility. A shared diesel engine generator will provide backup power for both the drillsite and production facility. The back-up power system will support life support systems such as lighting, control room functions, freeze protection systems (heat trace) and a UPS battery back-up system for items such as the emergency shutdown and communication systems.

Waste Disposal Facilities

Production facility wastes are designed to be minimal. All produced water will be injected down hole for water flood. No produced water or other process wastewater will be discharged.

Any unanticipated facility wastes will be collected, removed from site and disposed of accordingly. Drilling wastes will be disposed of through annular injection. There are no plans for a dedicated Class I or II disposal well on site. Domestic wastewater generated by the office will be hauled offsite for disposal or treated with a conventional onsite system (septic system).

Storm water collection in tank containment and well cellars will be tested for hydrocarbons and discharged off pad under an ADEC general permit or injected into the waterflood injection wells or a well annulus.

Offices/Production Camp

Operations, maintenance and administrative personnel will work 12-hour shifts with 24-hour coverage and leave the site while off duty. There will be a building provided for the production facility control room and limited office space. There will be no permanent overnight housing or camp facilities provided for the production facility other than the drillsite camp described previously.

Production Warehouse/Maintenance Shop

A structure will be provided for equipment storage and maintenance activities near the production facility. This warehouse/shop may be a lightweight steel-frame shelter with an arctic-rated fabric cover. Support facilities will also include firefighting equipment and pre-staged oil spill response equipment.

Fluid Storage and Transfer

Approximately fifteen storage tanks and associated transfer pumps will be located at the production facility adjacent to the drillsite. Services include oil sales, off spec/recycle oil, produced water skim/surge, seawater surge, diesel and, chemical storage. Several future

tanks may also be installed for additional capacity. Blanket gas and vapor recovery systems will be installed on all tanks which have the potential to contain volatile liquids.

Truck Loading Rack

An oil tanker truck loading rack with three to five stations will be installed to transport the oil via road 75 miles to the Tesoro refinery in Nikiski. Each loading station will incorporate full drive in/out containment, custody transfer metering, electrical grounding, overfill protection and vapor recovery as required. An oil tanker truck off-loading facility will be constructed at the Tesoro refinery to receive the sales oil. Additional loading stations may be installed as demand requires.

Flare System

A process flare will be installed to safely depressurize the production facility in the event of a significant emergency shutdown/blowdown event. The production facility flare would not be used for routine operations.

5.0 Gas and Oil Transportation

Pioneer has performed an assessment of various alternatives for transporting produced oil and gas to market. For oil, the alternatives considered included a marine terminal, various pipeline alignments to Nikiski, and trucking. Oil trucking 75 miles to the Tesoro Refinery was selected based on risk and cost factors. Gas disposition alternatives included on site electricity generation and pipeline transportation. A gas pipeline 16 miles to an existing distribution network in Ninilchik was selected based on cost and onsite air emission factors.

Outside the scope of this project, a third party plans to extend a gas pipeline from Ninilchik to Anchor Point. Pioneer will sell gas into the line within the boundary of the production facility. The likely right-of-way (ROW) for the pipeline would be along the Sterling Highway from Ninilchik; however, the final alignment selection is at the discretion of the owner and operator. Having access to a gas pipeline will reduce onsite air emissions and contribute to the need for gas distribution infrastructure 16 miles farther south than its current termination near Ninilchik.

The preferred oil transportation means is via truck. Trucks would be loaded at the production facility and off-loaded at the Tesoro refinery in Nikiski. The route would follow the Sterling Highway to Kalifornsky Beach Road connecting to the Kenai Spur Highway via Bridge Access Road. Trucking is the most cost-effective method for the size of the oil resource and would have the associated benefit of off-setting a portion of the crude oil currently being transported by marine tanker to Nikiski. A third party analysis of oil trucking was conducted to help select the route, quantify risks, and identify risk mitigation options. The analysis shows that the risk of spills for the route and volume transported is comparable to pipeline transportation. Mitigation elements under consideration include alignment and visibility improvements at the highway and subdivision entrances to the site, sufficient storage to allow interruption of trucking during inclement weather, and appropriate contractual incentives for the third party trucking company.

6.0 Schedule of Activities

Activity	Schedule
Conceptual Engineering and Design	Completed 2 nd quarter 2009
Permit Review and Approvals	4 th quarter 2009 to 1 st quarter 2010
Development Drilling	4 th quarter 2010 to 2015
Production Site Civil Work	Summer 2012
Production Facility Construction	2013-14
Seawater Intake Construction	2013
First Production	2014
Site Decommissioning and Closure	End of Field Life 2044

7.0 Gravel Operations

Gravel material for constructing the production pad would be obtained from commercial sources in the Anchor Point area (Figure 1-1). The production pad would be located on the surface lease, 5.5 miles north of Anchor Point and 0.5 miles west of the Sterling Highway. The site is an uplands location previously logged and used as a gravel pit. It is bounded on the west by the Cook Inlet and on the east by Stariski Creek. The western edge of the production and drillsite is 500 feet from the shore of Cook Inlet. The eastern edge is a minimum of approximately 800 feet from Stariski Creek. Oil-containing production facilities would be at least 1000 feet from Stariski Creek. The proposed location is within the ½-mile setback from waterbodies (2009 Cook Inlet Areawide Mitigation Measures), but it minimizes impacts to residential neighbors and uses land that has been previously developed as a gravel pit.

Pioneer is proposing to use approximately 30,000 cubic yards of Type IIA classified fill and leveling course material to increase the pad by approximately 15 acres (for a total size of approximately 20 acres). The proposed fill would have a target slope of zero percent to minimize surface run-off with directed flow to on-pad low spots to collect surface flow and allow infiltration. The elevation of the entire pad will be below the surrounding grade, which will provide barriers any offsite surface flow (Figure 7-1). Approximately 86,000 cubic yards of overburden from the site would be used to construct a vegetated berm on the eastern edge of the pad. The berm would serve to prevent run-off to Stariski Creek and act as a screen for visual and noise impacts. The berm would remain in place to facilitate site restoration at the end of project life.

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8.0 Access

Access by non-authorized personnel and the general public will be restricted at the drillsite to ensure worker and public safety. An access control plan has been developed in accordance with an air quality construction permit, describing measures such as security, signage, and fencing which are designed to exclude non-authorized parties.

8.1 Construction

Construction activities will take place primarily on the surface lease. Some staging and construction activities may occur on neighboring properties with the consent of landowners.

8.2 Production and Drillsite

The production and drillsite is accessible by existing roads. Only minor modifications to the access road from the Sterling Highway may be required, such as shifting the highway entrance to improve visibility to oncoming traffic. Access would be via standard passenger vehicles, trucks, and tractor trailers.

8.3 Seawater Intake

The seawater intake would be installed and accessed for maintenance by marine vessels (barge, boat, or landing craft) and divers. Construction activities will require the use of a tug and barge with anchoring system, crane, and other support equipment.

9.0 Development Drilling

Development drilling would begin prior to the completion of construction. A self-contained mobile drilling rig would be used for the duration of the well construction campaign with estimated conclusion of this work scheduled for 2014. A stationary or mobile rig support area complete with cuttings processing, fluid mixing, and fluid storage would be used during the drilling campaign and be removed at the completion of the drilling activities. The rig support area would include secondary containment, where appropriate, and be connected to the rig with a temporary aboveground pipe rack.

10.0 Operations

The production life of the drillsite is estimated to be 20 to 30 years. Water and possibly gas injection would be used as a reservoir management technique. Operations and maintenance responsibilities would include monitoring the wells, pump, pipeline and meter units; operating the production equipment, periodic well workovers; and routine operations and maintenance.

11.0 Site Closure/Rehabilitation

The production and drillsite would be abandoned, subject to lease obligations, after the economic life of the field has passed. Removal of facilities would be in accordance with state and federal agency approved abandonment plans and landowner agreements. The wells would be abandoned in accordance with accepted practices and in compliance with Alaska Oil and Gas Conservation Commission (AOGCC) regulations.

12.0 Water Resources

Fresh water from commercial sources would primarily be used for drilling and camp purposes. Only limited use of either groundwater or surface water is expected.

12.1 Drilling Water Use

The development drilling program would require approximately 36-60 months. A daily use of 25,000 to 35,000 gallons of water is estimated for a total consumption of approximately 38 million gallons during this program. This water would be hauled to the site from off-site commercial sources.

12.3 Production Water Use

Seawater and produced water would be used to maintain reservoir pressure over the life of the project. Design flow for voidage replacement and pressure maintenance will be approximately 10,000 barrels per day. Initially most of the water would be seawater. Seawater consumption will gradually decrease over time as it is replaced with produced water. All produced water will be re-injected into the reservoir.

12.4 Construction Water Use

Water will be required for facility hydro-testing. Commercial sources of water will likely be used, however, an application for a temporary water use permit will be made if water is to be taken from surface or groundwater from off the Hansen property.

12.5 Domestic Water Use

The limited amount of water needed for onsite personnel would be obtained either from an offsite commercial source or from a well installed on the property.

13.0 Waste Streams

13.1 Drill Waste

Water and oil-based muds will be used during the drilling operations. Used drilling fluids and cuttings would be processed through a cuttings processing facility and then injected into an approved well annulus. While drilling the first development well, it may be necessary to temporarily store drilling waste.

Pioneer will apply to the Alaska Department of Environmental Conservation (ADEC), Division of Environmental Health for a Temporary Storage of Drilling Waste Plan approval, as required in 18 AAC 60.430. The temporary cell would be located on the drillsite. The drilling waste cell is planned to be approximately 40 ft by 60 ft by 4 ft deep. With a working depth of 2 ft, the volume of the pit would be 4,800 cubic ft. This pit would be constructed with large square timbers held together with steel pins. A heavy synthetic liner inside the area would provide containment.

13.2 HDD Drilling Waste

The seawater intake horizontal drilling process will result in both cuttings and spent drilling fluids as waste streams. Cuttings are simply the ground up formation rock from the boring. They will be used on site as fill material or transported to an off-site disposal location. The volume of cuttings is estimated to be 6,000-10,000 cubic yards.

Drilling fluid is a mixture of fresh water and bentonite clay (approximately four percent clay). During drilling operations the fluid gradually builds up finely ground formation solids. Eventually solids accumulate to the point where the fluid can no longer perform its basic functions and must be changed out. It is expected that approximately 200,000 to 300,000 gallons of spent drilling fluids will be generated. The fluid will be placed in an open cell on-site or at an adjacent property with the consent of either landowner and allowed to dry. Final disposition of the dried solids will be with the consent of the landowner and ADEC.

13.3 Water Treatment

Prior to reservoir injection, solids must be removed from seawater and produced water. These solids, made up primarily of silt carried in the seawater and formation sand in the produced water, will be disposed of at an approved off-site location.

13.3 Solid Waste

Solid waste would be collected in segregated dumpsters. It would be hauled for disposal at the ADEC-permitted solid waste landfills in Homer or Soldotna.

13.4 Storm Water Management

Pioneer is developing a Storm Water Pollution Prevention Plan (SWPPP) to serve as the Best Management Practices Plan (BMP) to eliminate, to the extent practicable, contamination of storm water runoff for the production and drillsite. The SWPPP will involve measures such as protecting and monitoring open areas that receive storm water runoff, monitoring off-pad areas for evidence of a contaminated discharge, performing bi-annual inspections of the facility site before and after spring breakup, and immediately cleaning any spills by removing and disposing the contaminated materials at an approved facility.

The pad will be contoured to provide sufficient passive drainage of the entire surface. The production and drillsite will be mostly level with an on-pad depression to collect surface flow. Most precipitation will percolate naturally through the drillsite. Precipitation run off from buildings will be directed to the surface and also allowed to percolate naturally through the drillsite. Lined bermed areas for spill containment will be isolated from the surface drainage.

Potentially contaminated fluids collected within secondary containment areas will be disposed of off-site or used as drilling fluid make up water, added to the produced water and seawater injection system (provided such injection is approved by the AOGCC), or discharged to the pad in accordance with 18 AAC 75 and 72.

13.5 Snow Removal

The pad would be arranged to accommodate snow removal. Any potentially contaminated snow would be removed and disposed of at an approved facility or melted and re-used or treated on site.

14.0 Operating Procedures Designed to Prevent and Minimize Impacts

Pioneer intends to implement features and procedures designed to prevent or minimize impacts to the environment and human resources. The major mitigation features or procedures include:

- Extended reach directional drilling will be used to allow the siting of development facilities on shore.
- Oil transportation via tanker truck will eliminate the need for marine loading and reduce Tesoro's dependency on marine tanker deliveries.
- A third party gas pipeline will eliminate the need to combust the gas on-site and will result in an extension of utility gas infrastructure farther south than the current terminus in Ninilchik.
- Power from Homer Electric will minimize the amount of fuel stored on the production drillsite, minimize air emissions, and minimize noise impacts.
- An automated control and shutdown system will be used to provide continuous monitoring of the facility and allow quick reactions to critical process conditions that migrate out of pre-described operating setpoints.
- Secondary containment will provide at least 110 percent of the volume of any single tank or manifolded group of tanks for all appropriate fluids.
- Membership in Cook Inlet Spill Prevention and Response, Inc. will provide a readily-available and trained resource to supplement onsite spill response capabilities.
- Stormwater management practices and groundwater monitoring will minimize impacts to Stariski Creek and the Cook Inlet.
- The drillsite and production facilities will be located on previously developed land to minimize new impacts.

- Facility lighting will be designed to minimize off-site illumination.

Pioneer intends to avoid and minimize potential physical, biological, and human resource impacts that may result from the project through engineering, design, construction practices, standard operating procedures, and coordinated activity schedules.

15.0 Spill Prevention and Response

Pioneer has an ADEC-approved Oil Discharge Prevention and Contingency Plan for appraisal wells at the drillsite. The plan details the prevention and response measures in place for drilling activities. An additional plan is being developed to include the production facilities. Due to the location of the site and the low energy of the reservoir it would be very unlikely for oil to impact waters of Cook Inlet. The facilities will be designed with appropriate features to prevent spills and facilitate response activities. Pioneer is a member of Cook Inlet Spill Prevention and Response Inc.

16.0 Fish Habitat

The seawater intake line will be installed using HDD, minimizing direct mortality and habitat loss impacts during construction and operation. With the directional drilling rig located on the existing onshore gravel pad, the seawater intake footprint will be limited to the terminus of the pipe and associated intake device. The fish species most likely to be present near the intake structure include juvenile groundfish transitioning to deeper waters or adult groundfish using shallow waters for spawning. The intake structure is designed to minimize impingement and entrainment of juvenile and adult groundfish.

17.0 Wildlife Habitat

With the facility sited in an area that has been previously logged and used as a gravel pit there will be very little potential impacts to wildlife habitat. A brief description of offshore wildlife is included below; however, the seawater intake structure will have a very small footprint on the sea floor and will have only a de minimus impact to offshore habitat. Construction of the intake is planned for the late summer months to minimize potential wildlife impacts.

Beluga whale – The beluga whale is the most likely marine mammal species of concern in the project area as they occur in Cook Inlet year-round. During the summer and fall, belugas are concentrated in the upper inlet. They may occur in the project area in the winter months; however, sightings are rare in the lower inlet. The National Marine Fisheries Service (NMFS) Draft Conservation Plan describes the area offshore from the proposed project location to be Type 3 and 4, which is not high value for beluga whales.

Steller sea lion – Critical Steller sea lion habitat is located approximately 25 miles south of the proposed project area. Stellar sea lions have been reported at the mouth of Kachemak Bay and although not known in the project area, they could occasionally be found.

Sea otter – Two stocks of northern sea otter reside in Cook Inlet. The southwestern stock is listed as threatened under the Endangered Species Act (ESA), but sea otters that could be in the project area are considered to belong to the southcentral stock, whose population is stable.

Steller's eider – The Alaska Steller's eider population is federally designated as a threatened species and is an Alaska Species of Special Concern. Steller's eiders of the Alaska population primarily nest on the Arctic Coastal Plain of the North Slope, in addition to lower numbers on the Yukon Kuskokwim Delta. No critical habitat has been designated for Steller's eiders in Cook Inlet. Currently, most Steller's eiders winter in the Aleutians and Bering Sea. Steller's eiders in the vicinity of the proposed Cosmopolitan project would be limited to small numbers in offshore waters and wouldn't be impacted by the on-shore facility or the seawater intake.

18.0 Air Emissions

Diesel electric generators will likely be used for drilling activities, with a possibility of converting to grid power later in the drilling program. Power needs for processing will be obtained by extending electrical service to the site, backed up with on-site standby generation. Crude production processing emission sources will be limited to small process heaters. Other stationary sources may be categorized as small fuel-burning equipment and an emergency flare. There will be some mobile machinery emissions from drilling activity which will continue during facility operation. The only sources included in the activities after completion of drilling will be emergency power generating engines, the emergency smokeless flare, and process heaters. No planned production gas flaring would occur at the drillsite after appraisal activities. The proposed project should be defined as a minor source (less than 250 tons per year of any criteria pollutant) and would not require a Prevention of Significant Deterioration (PSD) permit. During construction there will be heavy construction equipment, light plants, and other construction equipment in use with typical diesel tailpipe emissions. Construction and its associated impacts will be a short-term activity.

Because the emissions will be minor, the air impacts will be small. Air quality construction and operating permits will be obtained that will limit impacts to ambient air.

19.0 Historic, Archeological, and Cultural Resources

Cultural resources studies for site clearance were conducted to assess any known sites, and to locate currently unknown sites (2001 and 2007). The recent study had two components: records review and in-field survey. The records review included the Alaska Heritage Resources Survey (AHRS) database, and literature provided by KPB and local residents. Other records reviewed included Cook Inlet shipwrecks and the results of previous cultural resources studies.

The field survey used on-the-ground investigation. Any known archaeological sites in the area were examined to assess their present condition and to pinpoint locations. Any new cultural resources sites discovered were documented and incorporated into the report previously submitted to ADNIR.

No cultural resource sites are anticipated to be affected by the project as proposed.

20.0 Public Use Areas

No designated public use areas are located within the project area.

21.0 Local Hire Policy

Pioneer strives to hire qualified local individuals to support this project. Pioneer is committed to continuing its relationships with local contractors and businesses in the development of the proposed Cosmopolitan Development Project.

22.0 Public Involvement

Pioneer has begun the consultation and coordination process with the regulatory agencies and local stakeholders including local residents, public officials, business associations, fishing organizations and conservation groups. Pioneer conducted the first local stakeholder meeting in Anchor Point in March 2005 and has continued to hold periodic meetings to share information on current and possible future activities. Most recently, stakeholder meetings were held in Homer, Anchor Point, and Kenai in October 2009. Site neighbors were also contacted at that time.

The public notice process for the permit applications will provide additional opportunities for the non-regulatory stakeholders to submit comments regarding the proposed action. Federal, state, and local agencies, and local non-governmental entities have been contacted by telephone, letters, or in meetings to discuss the Cosmopolitan Development Project.

23.0 Training

Pioneer's training program is designed to meet all state and federal requirements, as well as Kenai Peninsula-specific training as listed below.

Training typically includes the following:

- Environmental Awareness
- Cultural and Social Awareness
- Safety Training
- Hazardous Waste Operations and Emergency Response Training
- Bear Encounter Awareness

Drilling and other support operations require separate suites of training and certifications not listed here.

24.0 Contact List

- Operations Manager (24-hour contact)
Joey Hall (907) 343-2120 (office)
 (907) 529-1728 (cell)
 (907) 622-3110 (home)
- Manager – Land and External Affairs
J. Patrick Foley (907) 343-2110 (office)
 (907) 830-0999 (cell)
- Regulatory and Environmental Coordinator

John Hellén (907) 343-2102
- Drilling Manager
Vance Hazzard (907) 343-2116 (office)
 (907) 830-4645 (cell)

25.0 Potential Permits and Authorizations List

The following includes a list of potential permits and authorizations for the proposed project:

U.S. Army Corps of Engineers:

- Rivers and Harbors Act Section 10 and 404

U.S. Department of Interior Minerals Management Service:

- Development and Production Plan

Alaska Department Natural Resources:

- ACMP Coastal Project Questionnaire and Consistency Analysis, OPMP
- Unit Plan of Operations, DOG
- AHRS and Section 106 Cultural Site Clearance, ADNRR, Office of History and Archeology, State Historic Preservation Office

Alaska Department of Environmental Conservation:

- Oil Discharge Prevention and Contingency Plan, SPAR
- Oil Spill Financial Responsibility, SPAR
- Air Quality Construction Minor Permit, Division of Air Quality
- Drilling Waste Temporary Storage Plan Approval, Department of Environmental Health

Alaska Department of Transportation and Public Facilities

- Right of Way Permit

Alaska Oil and Gas Conservation Commission:

- Permits to Drill
- Annular Injection
- Pool Rules
- Area-wide Injection Order

Appendix A

Cosmopolitan Development Project 2009 Lease Mitigation Measures Analysis

Cosmopolitan Development Project – Lease Mitigation Measures

This table presents mitigation measures contained in the Cook Inlet Areawide Oil and Gas Lease Sale 2009 and notes how each measure is addressed by Pioneer Natural Resources Alaska, Inc. for the Cosmopolitan Development Project.

Lease Mitigation Measure	Where and How It Is Addressed
1. Facilities and Operations	
a) A plan of operations must be submitted and approved before conducting exploration, development or production activities, and must describe the lessee's efforts to minimize impacts on residential, commercial, and recreational areas, Native allotments and subsistence use areas, and adjacent private lands. At the time of application, lessee must submit a copy of the proposed plan of operations to all surface owners whose property will be entered.	The Plan of Operations has been submitted to ADNR and to the owner of the property.
b) Facilities must be designed and operated to minimize sight and sound impacts in areas of high residential, commercial, recreational, and subsistence use and important wildlife habitat. Methods may include providing natural buffers and screening to conceal facilities, sound insulation of facilities, or by using alternative means approved by the director, in consultation with ADF&G.	Landscaping and site topography will be used to minimize impacts. Trees have already been planted along the northern boundary. A vegetated berm is planned for the eastern edge (Stariski Creek side) of the pad. Drilling rig and production facility design incorporates sound mitigation techniques such as engine mufflers, barriers, and insulation.
c) The siting of onshore facilities, other than roads, docks, utility or pipeline corridors, or terminal facilities will be prohibited within one-half mile of the mean high water of Cook Inlet, except where land use plans classify an area for development, or established usage and use history show development. The siting of facilities other than docks, roads, utility, and pipeline crossings will also be prohibited within 500 feet of all fish bearing streams and waterbodies and 1,500 feet of all current surface drinking water sources. Additionally, to the extent practicable, the siting of facilities will be prohibited within one-half mile of the banks of the main channel of the Harriet, Alexander, Lake, Deep, and Stariski creeks, and the Drift, Big, Kustatan, McArthur, Chuitna, Lewis, Theodore, Beluga, Susitna, Little Susitna, Kenai, Kasilof, Ninilchik, and Anchor rivers. Facilities may be sited within these buffers if the lessee demonstrates to the satisfaction of the director, in consultation with ADF&G, that site locations outside these buffers are not practicable or that a location inside the buffer is environmentally preferred. Road, utility, and pipeline crossings must be consolidated and aligned perpendicular or near perpendicular to watercourses.	<p>Pioneer is requesting approval to site facilities less than 0.5 miles from both Cook Inlet and Stariski Creek.</p> <p>The existing exploration well is located less than 0.5 miles from Cook Inlet and the nearest bank of Stariski Creek. The proposed drilling and production pad edges are a minimum of 500 feet away from Cook Inlet and Stariski Creek. This location is environmentally preferable to other practical options. Construction and operation practices will be implemented to ensure the protection of water bodies.</p> <p>All operationally feasible locations were considered. The proposed site is preferable for these reasons: 1) ability to reach the bottomhole targets, 2) lowest impact on the environment, and 3) lowest impact to local residences and businesses.</p> <p>Figure 1-1 of the plan shows the proposed location in relation to geographic features such as Stariski Creek, mean high tide, and inlet and creek bluffs. The site was selected based on the size of the lot, ownership, availability, cost, prior industrial activity, proximity to reservoir to be drilled, and environmental sensitivity, among other</p>

Lease Mitigation Measure	Where and How It Is Addressed
	<p>factors. It is an upland lot, and contains no designated wetlands or endangered species. It will be located primarily on the existing pad and existing gravel pit, minimizing development on less impacted land and maximizing the distance from existing residences.</p> <p>To address potential ADF&G concerns, landscaping and site topography will be used to minimize impacts. The access road is sited such that it doesn't cross Stariski Creek. Oil and drilling waste storage areas will be diked and lined. Drilling wastes will be disposed of in approved well annuli. Trajectory modeling in the ODPCP demonstrates that a potential well blowout is unlikely to impact either Cook Inlet or Stariski Creek. The oil handling facilities will be located on the far side of the production pad from the creek. During construction and operation best management practices will be used to minimize the potential for sediment runoff. Site grading will be designed to minimize off-site stormwater flow and a vegetated berm will be placed on the eastern edge of the pad.</p>
<p>d) Impacts to identified wetlands must be minimized to the satisfaction of the director, in consultation with ADF&G and ADEC. The director will consider whether facilities are sited in the least sensitive areas. Further, all activities within wetlands require permission from the U.S. Army Corps of Engineers (see Lessee Advisories).</p>	<p>A wetland survey conducted at the site found no U.S. Army Corps of Engineers jurisdictional wetlands.</p>
<p>e) Exploration activities must be supported by air service, an existing road system or port facility, ice roads, or by off-road vehicles that do not cause significant damage to the vegetation or ground surface. Construction of temporary drill pads, airstrips, and roads may be allowed. Construction of permanent roads may be allowed upon approval by the director. Unrestricted surface travel may be permitted by the director and DMLW, if an emergency condition exists.</p>	<p>Not applicable to development activities; however, the site will be accessed by existing roads.</p>
<p>f) With the exception of drill pads, airstrips, and roads permitted under A1e, exploration facilities must be consolidated, temporary, and must not be constructed of gravel. Use of abandoned gravel structures may be permitted on a case-by-case basis.</p>	<p>Not applicable to development activities.</p>
<p>g) Pipelines must utilize existing transportation corridors and be buried where conditions permit. Pipelines and gravel pads must be designed to facilitate the containment and cleanup of spilled fluids. Pipelines, flowlines, and gathering lines must be designed and constructed to assure integrity against climatic conditions and geologic hazards.</p> <p>In areas with above ground placement, pipelines must be designed, sited, and constructed to allow for the free movement of wildlife. Where practicable, pipelines must be located on the upslope side of</p>	<p>A pipeline is not part of this project. Pioneer plans to come to an agreement with a third party to construct and operate a gas pipeline extension to the site. The third party gas line will likely be below ground.</p>

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roadways and construction pads, unless DMLW determines that an alternative site is environmentally acceptable.	
h) Pipelines that must cross marine waters will be constructed beneath the marine waters using directional drilling techniques, unless the director, in consultation with ADF&G and the local borough and Coastal Resource Service Areas, approves an alternative method based on technical, environmental, and economic justification. Offshore pipelines must be located and constructed to prevent obstruction to marine navigation and fishing operations.	No marine pipelines are proposed. However, the seawater intake line will be constructed using directional drilling techniques and designed and sited to prevent conflicts with marine navigation and fishing operations.
i) Gravel mining sites required for exploration and development activities will be restricted to the minimum necessary to develop the field efficiently and to minimize environmental damage. Gravel mine sites required for exploration activities must not be located within an active floodplain of a watercourse unless DMLW, after consultation with ADF&G, determines that there is no practicable alternative, or that a floodplain site would be compatible with fish and wildlife habitat after mining operations are completed and the site is closed.	Gravel will be purchased from a commercial operation.
2. Habitat, Fish, and Wildlife	
a) Detonation of explosives will be prohibited in open water areas of fish bearing streams and lakes. Explosives must not be detonated beneath, or in close proximity to, fish-bearing streams and lakes if the detonation of the explosive produces a pressure rise in the water body of greater than 2.7 pounds per-square-inch, or unless the water body, including its substrate, is solidly frozen. Detonation of explosives within or in close proximity to a fish spawning bed during the early stages of egg incubation must not produce a peak particle velocity greater than 0.5 inches per second. Blasting criteria have been developed by ADF&G and are available from ADF&G upon request. The location of known fish bearing waters within the project area can be obtained from ADF&G.	No explosives will be used in open water areas.
b) Compaction or removal of snow cover overlying fish bearing water bodies is prohibited except for approved crossings. If ice thickness is not sufficient to facilitate a crossing, ice and/or snow bridges may be required.	No work will be conducted over frozen water bodies.
c) Removal of water from fishbearing rivers, streams and natural lakes shall be subject to prior written approval by DMLW and ADF&G. Water intake pipes used to remove water from fish bearing waterbodies must be surrounded by a screened enclosure to prevent fish entrainment and impingement. Screen mesh size shall be no greater than 1 mm (0.04 inches), unless another size has been approved by ADF&G. The maximum water velocity at the surface of the screen enclosure may be no greater than 0.4 feet per second, unless an alternative velocity has been approved by ADF&G. Screen material must be corrosion resistant, and must be adequately supported to prevent excessive sagging which could result in unusable intake surface. The intake structure must be designed and installed to avoid excessive fouling from floating debris, and a minimum of eight square feet of effective wetted screen surface must be provided for each multiple of a 450-gallon per minute (one	Pioneer will not remove water from fishbearing rivers, streams, or natural lakes. Most fresh water will be obtained from commercial sources. The use of seawater is proposed for reservoir injection. The seawater intake will be equipped with an approved screen. The intake structure is being submitted to ADF&G.

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cubic foot per second) pumping rate. The pump intake opening must be placed equidistant from all effective wetted screen surfaces.	
<p>d) Surface entry will be prohibited in parcels that are within the Kenai River Special Management Area.</p> <p>Surface entry, other than access, will be prohibited on state lands within the Kenai National Wildlife refuge.</p> <p>Lessees are prohibited from placing drilling rigs and lease-related facilities and structures within an area near the Kenai River composed of: all land within Section 36 in T6N, R11W that is located south of a line drawn from the protracted NE corner to the protracted SW corner of the section; all land within the western half of Section 31 in T6N, R10W and Section 6 in T5N, R10W; and all land within Section 1 in T5N, R11W.</p>	<p>The surface facilities are not located within the Kenai River Special Management Area, the Kenai National Wildlife Refuge, or the area near the Kenai River.</p>
e) Surface entry into the critical waterfowl habitat along the Kasilof River is prohibited. Directional drilling from adjacent sites may be allowed.	<p>The proposed project is not located in the critical waterfowl habitat along the Kasilof River.</p>
f) Surface entry will be prohibited within one-quarter mile of trumpeter swan nesting sites between April 1 and August 31. The siting of permanent facilities, including roads, material sites, storage areas, powerlines, and above ground pipelines will be prohibited within one-quarter mile of known nesting sites. Trumpeter swan nesting sites will be identified by ADF&G at the request of the lessee.	<p>The project location contains no trumpeter swan habitat. A wildlife survey was conducted in July 2007. No trumpeter swan nesting sites were noted at the project location.</p>
g) The director, in consultation with ADF&G, shall restrict or modify lease related activities if scientific evidence documents the presence of Steller's eiders from the Alaska breeding population in the lease area and it is determined that oil and gas exploration and development will impact them or their over-wintering habitat in the near-shore waters of Cook Inlet.	<p>Steller's eiders are known to winter in near shore areas from Anchor Point to Ninilchik. The only proposed offshore activity is the seawater intake/outfall. The intake will be installed using horizontal directional drilling, limiting impacts to the seafloor immediately surrounding the intake and outfall structures. In addition, installation will be scheduled in late summer when eiders are not present.</p>
h) The director, in consultation with ADF&G, may impose seasonal restrictions on activities located in and adjacent to important waterfowl and shorebird habitat during the plan of operations approval stage.	
<p>Bears</p> <p>i) Lessees are required to prepare and implement a human-bear interaction plan designed to minimize conflicts between bears and humans. The plan shall include measures to:</p> <p>i. minimize attraction of bears to facility sites, including garbage and food waste;</p> <p>ii. organize layout of buildings and work areas to minimize interactions between humans and bears such as including the use of electric fencing;</p> <p>iii. warn personnel of bears near or on facilities and the proper actions to take;</p> <p>iv. if authorized, deter bears from the drill site;</p>	<p>The project is not located near any identified brown bear movement corridors nor is it near areas frequented by bears, however, a Bear Encounter Plan has been prepared.</p>

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<p>v. provide contingencies in the event bears do not leave the site;</p> <p>vi. provide for proper storage and disposal of materials that may be toxic to bears; and</p> <p>vii. document and communicate the sighting of bears onsite or in the immediate area to all shift employees.</p>	
<p>j) Before commencement of any activities, lessees shall consult with ADF&G to identify the locations of known bear den sites that are occupied in the season of proposed activities. Exploration and development activities started between November 15 and March 31 may not be conducted within one-half mile of known occupied brown bear dens, unless alternative mitigation measures are approved by the ADF&G. A lessee who encounters an occupied den not previously identified by ADF&G must report it to the Division of Wildlife Conservation, ADF&G, within 24 hours. Mobile activities shall avoid such discovered occupied dens by one-half mile unless alternative mitigation measures are approved by DO&G with concurrence from ADF&G. Non-mobile facilities will not be required to be relocated.</p>	<p>Pioneer has previously consulted with ADF&G to identify the locations of known bear den sites. None were identified. Prior to commencement of activities, Pioneer will again consult.</p>
<p>k) Recognizing the importance of sufficient vegetative cover and access by Kenai Peninsula brown bears feeding at streams, the director, in consultation with ADF&G, may require lessees to locate exploration and development facilities beyond the 500-foot buffer along anadromous streams during the plan of operations approval stage, except as provided in A1c.</p>	
<p>Caribou</p> <p>l) Surface entry within the core calving area of the Kenai Lowlands Caribou Herd is prohibited, except that surface entry for seismic exploration will be allowed from October 16 to March 31.</p> <p>m) Exploration and development activities will be restricted or prohibited between April 1 and October 15 within the core summer habitat of the Kenai Lowlands Caribou Herd, except that maintenance and operation of production wells will be allowed year-round. Permanent roads, or facilities other than production wells, will also be restricted or prohibited within this area. Facilities within the core summer habitat of the Kenai Lowlands Caribou Herd that require year-round access must be located in forested areas, where practical.</p> <p>n) Pipelines must be buried within the core summer habitat of the Kenai Lowlands Caribou Herd.</p>	<p>The drilling and production site is not located in any of the caribou areas.</p>
<p>o) The director, in consultation with ADF&G, may impose seasonal restrictions on activities located in, or requiring travel through or overflight of, important moose or caribou calving and wintering areas during the plan of operations approval stage.</p>	
<p>Beluga Whales</p> <p>p) No permanent or temporary oil and gas exploration or development may occur within High Value/High Sensitivity (Type 1) beluga whale habitat areas, unless it occurs on upland areas (above Mean Higher Water datum). Type 1 habitat areas include the following tracts: 320-334, 391-409, 410, 462, 464-475, 476-481, 483,</p>	<p>No permanent or temporary offshore structures are proposed for any of the identified tracts.</p>

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484, 485, 486, 493, 494, 497, 498, 522, 524-537, 538, 539, 540, 541, 542, 543, 544, 547-552, 559, 575-577, 579, 581, 582, 585, 586, 590, 593, 594, 598, 616-618, 620-623, 627, 655-658, and 662.	
q) The director will assess oil and gas-related activities within all High Value (Type 2) beluga whale habitat areas on a case-by-case basis. No permanent surface entry or structures are allowed, and temporary activities and structures, for example exploration drilling, will only be allowed between November 1 and April 1 of each year, unless it occurs on upland areas, within the following tracts: 021, 022, 126, 127, 129-132, 161, 162, 175, 177, 211, 218, 257, 301, 302, 373, 376, 377, and 384.	No permanent or temporary offshore structures are proposed for any of the identified tracts.
r) The director will assess oil and gas-related activities within the remaining tracts (Type 3 habitat areas) on a case-by-case basis.	Few beluga whales are expected to occur within the project area, especially during the time of year when the offshore facilities (seawater intake) will be installed. With the minimal footprint, possible disturbance to beluga whales will be negligible.
3. Subsistence, and Other Fish and Wildlife Uses	
a) Lease-related use will be restricted when DO&G determines it is necessary to prevent unreasonable conflicts between lease-related activities and subsistence, and commercial, sport, personal use, and educational harvest activities. In enforcing this term DO&G, during review of plans of operation, will consult with other agencies, the affected local borough(s) and the public to identify and avoid potential conflicts. In order to avoid conflicts with subsistence, commercial, sport and educational harvest activities, restrictions may include alternative site selection, requiring directional drilling, seasonal drilling restrictions, and other technologies deemed appropriate by DO&G.	The onshore location of the well, compared to an offshore or beach location, will help minimize potential conflicts with marine and shoreline subsistence users. Since the drilling and production site is on private land with no public access and minimal habitat value for subsistence resources, it will not conflict with subsistence users. The proposed seawater intake is not located near traditional commercial fishing areas. In addition, it is being designed and installed to avoid potential conflicts with marine users.
4. Fuel, Hazardous Substances, and Waste	
a) Secondary containment (see definitions) shall be provided for the storage of fuel or hazardous substances.	Impermeable lining and diking will be used for all oil storage facilities.
b) Containers with an aggregate storage capacity of greater than 55 gallons which contain fuel or hazardous substances shall not be stored within 100 feet of a waterbody, or within 1,500 feet of a current surface drinking water source.	All fuel and hazardous substances will be stored more than 500 feet from water bodies.
c) During equipment storage or maintenance, the site shall be protected from leaking or dripping fuel and hazardous substances by the placement of drip pans or other surface liners designed to catch and hold fluids under the equipment, or by creating an area for storage or maintenance using an impermeable liner or other suitable containment mechanism.	Storage or maintenance of equipment containing fuel or hazardous substances will be on drip pads or within lined secondary containment.
d) During fuel or hazardous substance transfer, secondary containment or a surface liner must be placed under all container or vehicle fuel tank inlet and outlet points, hose connections, and hose ends. Appropriate spill response equipment, sufficient to respond to a spill of up to five gallons, must be on hand during any transfer or	Pioneer will follow standards in the Alaska Safety Handbook and North Slope Environmental Field Handbook for fuel and hazardous substance transfers to portable tanks and equipment, including the use of

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handling of fuel or hazardous substances. Trained personnel shall attend transfer operations at all times.	secondary containment, monitoring, and the availability of spill response materials.
e) Vehicle refueling shall not occur within the annual floodplain, except as addressed and approved in the plan of operations. This measure does not apply to water-borne vessels.	No operations are anticipated in any floodplains.
f) All independent fuel and hazardous substance containers shall be marked with the contents and the lessee's or contractor's name using paint or a permanent label.	Containers will be appropriately labeled.
g) A freshwater aquifer monitoring well, and quarterly water quality monitoring, may be required down gradient of a permanent above-ground liquid hydrocarbon storage facility.	
h) Waste from operations must be reduced, reused, or recycled to the maximum extent practicable. Garbage and domestic combustibles must be incinerated or disposed of at an approved site in accordance with 18 AAC 60. (See also Section B2, below.)	Pioneer will reduce, reuse, or recycle solid wastes generated from development as practicable. Garbage and domestic refuse will be disposed of at the Soldotna or Homer landfills. Waste disposal is discussed in Section 13 of the Plan of Operations.
i) New solid waste disposal sites will not be approved or located on state property during the exploratory phase. Exceptions may be provided for drilling waste if the facility will comply with the applicable provisions of 18 AAC 60.	Not applicable, no new disposal sites are proposed.
j) Wherever practicable, the preferred method for disposal of muds and cuttings from oil and gas activities is by underground injection. Other methods of disposal shall be allowed only upon approval by the director, in consultation with ADEC and ADF&G.	Drilling mud and cuttings will be disposed of by annular injection or an approved alternative. No surface disposal of oil-well muds or cuttings will occur. Muds and cuttings from the directional drilling of the seawater intake line may be disposed and/or reused on site or at a nearby location.
5. Access	
a) Public access to, or use of, the lease area may not be restricted except within the immediate vicinity of drill sites, buildings, and other related facilities. Areas of restricted access must be identified in the plan of operations. Lease facilities and operations shall not be located so as to block access to or along navigable or public waters as defined in AS 38.05.965.	Site access is described in Section 8 of the plan. The site will be accessed on existing roads. The site is on private property and is not open to the public. Project operations will not block access to any navigable or public waters. An ambient air quality exclusion zone will not extend beyond the Pioneer surface lease boundary, where access will be restricted.
6. Prehistoric, Historic, and Archeological Sites	
a) Before the construction or placement of any gravel, or other structure, road, or facility resulting from exploration, development, or production activities, the lessee must conduct an inventory of prehistoric, historic, and archeological sites within the area affected by an activity. The inventory must include consideration of literature provided by the affected borough and local residents; documentation of oral history regarding prehistoric and historic uses of such sites; evidence of consultation with the Alaska Heritage Resources Survey and the National Register of Historic Places; and	An inventory of prehistoric, historic, and archeological sites/resources was conducted in September 2000 and expanded to include potential pipeline routes in July 2007. Copies of the reports were submitted to the ADNRR Office of History and Archaeology (OHA).

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site surveys. The inventory must also include a detailed analysis of the effects that might result from the activity.	
b) The inventory of prehistoric, historic, and archeological sites must be submitted to the director, and to DPOR Office of History and Archaeology, who will coordinate with the affected borough for review and comment. If a prehistoric, historic, or archeological site or area could be adversely affected by a lease activity, the director, after consultation with DPOR Office of History and Archaeology and the affected borough, will direct the lessee as to the course of action to take to avoid or minimize adverse effects.	Copies of the 2000 and 2007 reports were previously provided to ADNOR OHA.
c) If a site, structure, or object of prehistoric, historic, or archaeological significance is discovered during lease operations, the lessee must report the discovery to the director as soon as possible. The lessee must make reasonable efforts to preserve and protect the discovered site, structure, or object from damage until the director, after consultation with DPOR Office of History and Archaeology and the affected borough, has directed the lessee as to the course of action to take for its preservation.	Any discovered sites will be protected until consultation with DPOR.
7. Local Hire, Communication, and Training	
a) Lessees are encouraged to employ local and Alaska residents and contractors, to the extent they are available and qualified, for work performed in the lease area. Lessees shall submit, as part of the plan of operations, a proposal detailing the means by which the lessee will comply with the measure. The proposal must include a description of the operator's plans for partnering with local communities to recruit, hire, and train local and Alaska residents and contractors. The lessee is encouraged, in formulating this proposal, to coordinate with employment and training services offered by the State of Alaska and local communities to train and recruit employees from local communities.	Pioneer places hiring preference on Alaskans. Local hire will be encouraged, as discussed in Section 21 of the plan.
b) A plan of operations application must describe the lessee's past and prospective efforts to communicate with local communities and interested local community groups.	Community outreach and public involvement are discussed in Section 22 of the plan.
c) A plan of operations application must include a training program for all personnel including contractors and subcontractors. The program must be designed to inform each person working on the project of environmental, social, and cultural concerns that relate to that person's job. The program must use methods to ensure that personnel understand and use techniques necessary to preserve geological, archeological, and biological resources. In addition, the program must be designed to help personnel increase their sensitivity and understanding of community values, customs, and lifestyles in areas where they will be operating.	Pioneer will implement a training program for all onsite employees and contractors. The training program will address environmental, cultural, and social issues, as discussed in Section 23 of the plan.